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Takasi YAMAZAKI*: Critical notes on some
Scrophulariaceae from Indo-China

山崎敬*: 印度支那產ゴマノハグサ科植物評論

Many specimens of Indo-China collected by the late Prof. B. Hayata, were left unidentified in the Herbarium of the University of Tokyo. He travelled to north-western Tongking and Yunnan from June to August in 1917; to Annam from May to June in 1921; and to north-western Siam from September to December in 1921. In the present paper, the author treated *Vandellia* and its allied genera mostly based on the specimens in Hayata's collection.

Subtribe Vandelliae, of which a few species are distributed in Japan, is abundant and variable in the warmer portions of the Old World, especially in Indo-China, India and Central Africa. Many genera and species of Indo-Chinese Vandelliae have been reported by Bonati, and they are as follows: *Lindernia*, *Bonnaya*, *Vandellia*, *Torenia*, *Artanema*, *Geoffraya*, and *Curanga*. These groups are so highly variable in Indo-China, that the sharp demarcation lines among them have not been easily drawn, and many questions are still left unsettled. In Hayata's collection, the author also found some specimens which show intermediate characters between some genera. If we shall further proceed the botanical investigation of this area, the classification of Vandelliae will become clearer.

Artanema D. Don in Sweet, Brit. Fl. Gard. ser. 2, t. 234 (1834); Bentham in DC., Prodr. 10: 408 (1846); Bentham et Hooker, Gen. Pl. 2: 952 (1876); Wettstein in Engler, Nat. Pfl.-famil. IV, 3-b: 79 (1895); S. A. Skan in Curt. Bot. Mag. t. 8687 (1916).

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Sect. I. **Euartanema** Yamazaki, sect. nov.

Caulis erectus. Racemus terminalis multiflorifer. Sepala ovato-lanceolata valde imbricata. Corollae tubus infundibuliformis. Ovarium ovoideum. Stamina 2 postica longa, filamentis quam antheris longioribus. Capsula ovoidea vel globosa.....: *A. fimbriatum*
D. Don; *A. longifolium*
 Vatke; *A. sesamoides*
 Bentham.

Sect. II. **Clematicaulon** Yamazaki,
sect. nov.

Caulis inferius prostratus sublignosus ad nodos radicans superius elongatus sarmentosus. Inflorescentia in axillis foliorum vel in terminalibus ramulorum racemosa pauciflora. Sepala linearia non imbricata. Corollae tubus angustatus elongato-cylindricus. Ovarium oblongum. Stamina 2 postica brevia, filamentis antheris subaequilongis. Capsula cylindrica.

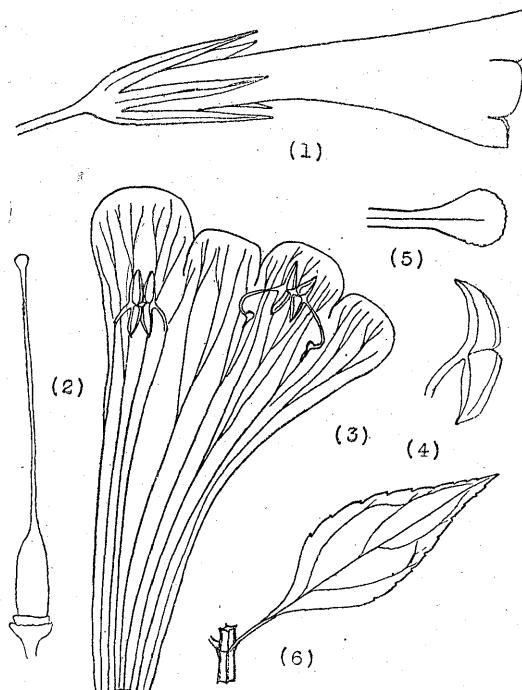


Fig. 1. *Artanema Finetianum*. 1) Flos. $\times 3$, 2) Pistillum. $\times 3$,
 3) Corolla expansa $\times 3$, 4) Anthera auct. 5) Stigma auct. 6)
 Folium mag. nat.

Artanema Finetianum (Bonati) Yamazaki, comb. nov.—*Torenia Finetiana* Bonati in Bull. Soc. Bot. Genève, 1913: 312, non vidi; in Lecomte, Fl. Gén. Indo-Chine, 4: 392 (1927).

Caulis elongatus prostratus rigidus sublignosus sarmentosus glaber tetragonus angustissime alatus, ramis gracilibus elongatis. Folia membranacea opposita, petiolis gracilibus 6–10 mm. longis glabris, laminis oblongo-lanceolatis basi in petiolum attenuato-acuminatis apice acuminatis margine utrinque 8–9-serratis 20–35 mm. longis 6–12 mm. latis infra glabris conspicue nervosis supra margine

sparse scabridis obsolete nervosis, serris adpresissimis mucronatis. Inflorescentia in axillis foliorum vel in terminalibus ramulorum racemosa 1-3-florifera, pedunculis gracilibus 8-16 mm. longis glabris, bracteis linearibus 2-5 mm. longis, pedicellis gracilibus striatis 30 mm. longis glabris. Calyx campanulatus glaber profunde 5-partitus 10 mm. longus basi angustissime 5-alatus in pedicellis attenuatus, laciniis lanceolato-linearibus acuminatis 1-costatis 9 mm. longis 1.2 mm. latis glabris. Corolla 23 mm. longa, tubo elongato cylindrico ca. 19 mm. longo extus sparse glanduloso-piloso, fauce glabro, labio superiore orbiculato subaequaliter trilobato ca. 4 mm. longo, lobis orbiculatis ca. 2.5 mm. longis 3 mm. latis. Stamina 2 postica perfecta, filamentis brevissimis, 2 antica perfecta, appendicibus gibbosis, antheris magnis ca. 2 mm. longis, loculis triangularibus parallelis acutis. Ovarium oblique oblongum glabrum. Stylus 9 mm. longus calyce longior. Stigma flabellata. A typo, foliis minoribus, inflorescentibus racemosis bracteatis, pedicellis brevioribus, floribus minoribus differt.

Hab. Tongking: Dalat (B. Hayata, 10 Jun. 1921).

A plant which was collected from Dalat in Tongking, strikingly resembles *Torenia Finetiana*, though it differs in having smaller leaves and flowers. *T. Finetiana* has leaves up to 5 cm long and large flowers up to 4 cm long, whereas the former has leaves up to 3.5 cm long and a flower 2 cm long, although they agree in all essential characters. As I had no chance to examine many materials and could not determine the variability of these two plants, I treated them as the same species. These plants have marked characteristics in having a somewhat woody and creeping lower stem, climbing upper stems, deeply cleft calyces with five slight ribs at the lower part, linear-shaped sepals, large corollas with rounded upper lips, triangular anther-cells, and slanting ovaries which are oblong and glabrous throughout. The corolla resembles that of *Torenia*, but on the other hand the separated sepals and the glabrous ovaries resemble those of *Vandellia*, and so Bonati said "Haberi potest saltem pro typo cuiusdam novae sectionis generis, si non pro typo cuiusdam novi generis." (in Bull. Soc. Bot. France, 24: 1097, 1924).

These plants differ from other *Torenia* in having somewhat woody and climbing stems, separated sepals, triangular anther-cells, and glabrous ovaries, and from *Vandellia* in having larger flowers, rounded upper corolla-lips, and triangular anther-cells, so it can neither be united with *Vandellia* nor *Torenia*. These characters match well those of *Artanema*, which is widely distributed in

tropical regions and has been recorded in 3 species. *Artanema* is characterized by upright stems, many-flowered apical inflorescences, leafy sepals, and ovoid or globose ovaries and capsules, so it does not entirely agree with *Torenia Finetiana* and the species closely related to it. However, *Artanema* is most closely allied with them, and by excluding them, *Torenia* becomes a homogeneous genus. For the above mentioned reasons, *Artanema* will be divided into two new sections *Euartanema* and *Clematicaulon*. I have had no chance to see the specimens of

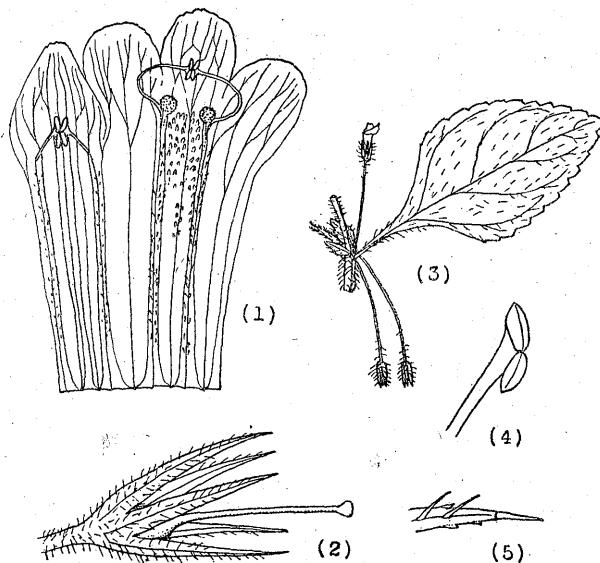


Fig. 2. *Vandellia nutans*, 1) Corolla expansa $\times 6$, 2) Flos, Corolla amorta $\times 6$. 3) Folium et inflorescentia, mag. nat., 4) Anthera auct., 5) Pars sepalis auct.

Euartanema, and could not ascertain the variability of this genus, and these plants need further study.

Artanema Evrardii (Bonati) Yamazaki, comb. nov.—*Torenia Evrardii* Bonati in Bull. Soc. Bot. France, 24: 1097 (1924); in Lecomte, l.c. 392 (1927).

Vandellia nutans Yamazaki. sp. nov.

Herba annua. Radix fibrosa. Caulis sympodialis gracilis elongatus repens ad nodos radicans tetragonous in faciebus sulcatus lucidus glabrescens ad angulos inferiore sparse superiore subdense patente albo-hirsutus 20-30 cm longus apice in

anthesi reductus 2-3-florifer, ramis in axillis foliorum elongatus axiformibus. Folia membranacea, petiolis 6-11 mm. longis gracilibus glabrescentibus vel subdense patente hirsutis, laminis late ovatis acutis glabris vel sparse hirsutis subtus sparse hirsutis 18-32 mm. longis 12-22 mm. latis. Flores ad axillas foliorum superiorum 2-3-umbellati, pedunculis nullis, pedicellis gracilibus in anthesi erectis 9-12 mm. longis in fructu nutantibus 12-16 mm. longis tetragonis patente hirsutis. Bracteae setaceae acuminatae 1-1.5 mm. longae. Calyx campanalatus fere ad basin 5-partitus dense longe albo-hirsutus in anthesi 3-4 mm. in fructu 5-7 mm. longus, laciniis linearibus acuminatis margine membranaceis glabrescentibus extus longi-hirsutis apice setaceis. Corolla albida ca. 7 mm. longa calyce superans, tubo campanulato-cylindrico ca. 4 mm. longo extus glabro intus quadrifarium-glanduloso, fauce ventrale lanato, labio superiore ovato apice obtuso vix repando ca. 2.5 mm. longo et lato, labio inferiore superiore vix superans ca. 3mm. longo subaequaliter trilobato, lobis elliptico-orbiculatis ca. 2 mm. longis et latis margine leviter repandulis. Stamina 2 antica perfecta, appendicibus evolutis globosis tuberculatis, antherarum loculis obtusiusculis. Ovarium ovato-globosum glabrum. Stylus ca. 4 mm. longus calyce vix superans. Stigma orbiculata. Capsula elliptica acuminata calyce subaequilonga vel brevior 5-6 mm. longus 3-4 mm. latus, valvis membranaceis. Semina elliptica rufescentia multi-lacunosa ca. 0.45 mm. longa 0.3 mm. lata, testa papillosa.

Hab. Siam: Doi-step (B. Hayata, 3 Oct. 1921—Typus in Herb. Univ. Tokyo).

This plant seems to be related to sect. Tittomania in having deeply cleft calyces and elliptical capsules which are equal to or a little shorter than the calyces. It has, however, umbellate inflorescence and sympodial branching unlike all the other members of the section which have racemous inflorescence or axillary flowers and monopodial branching. Appendices of the lower stamens are large, globose, and are covered with many punctate glands. Such large appendices cannot be seen in the others, and are known in *Craterostigma* as one of the important characters of the genus.

Vandellia ligulata Yamazaki, sp. nov.

Radix perpendicularis. Caulis elongatus gracilis ascendens ramosus tetragonus glaber ca. 15 cm. longus, ramis gracillimis divaricatis. Folia chartacea opposita, petiolis brevissimis ca. 0.5 mm. longis, laminis ovatis basi rotundatis apice acutiusculis margine utrinque obsolete 2-3-dentatis 4-6 mm. longis 2-3.5 mm. latis utrinque glabrescentibus, dentibus adpressis argutis margine sub lente

scabridis. Inflorescentia terminales racemosa fasciculata 1-5-florifera. Bracteae inferiores foliformes superiores minutae. Pedicelli graciles tetragoni 5-13 mm. longi glabrescentes vel sparsissime puberuli. Calyx cylindricus glabrescens 4 mm. longus 5-costatus ad costas obsolete alatus apice bifidus, laciniis ca. 2 mm. longis superioribus irregulariter trilobatis inferioribus bilobatis glabris, alis sparse puberulis.

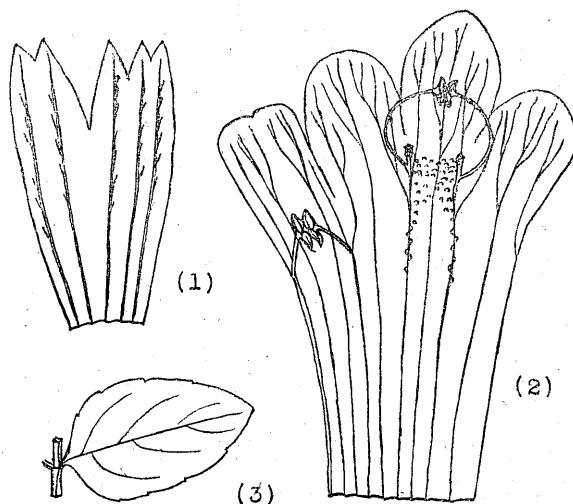


Fig. 3. *Vandellia ligulata*. 1) Calyx expansa $\times 6$, 2) Corolla expansa $\times 6$,
3) Folium mag. nat.

Corolla ca. 9 mm. longa, tubo ca. 6 mm. longo extus glabro, fauce ventrale punctato, labio superiore elliptico apice truncato leviter emarginato ca. 2.5 mm. longo subaequaliter trilobato, lobis orbiculatis ca. 3 mm. longis et latis. Stamina 2 antica fertilia, appendicibus subcarnosis clavatis. Ovarium oblongo-ellipticum glabrum. Stylus calyce superans ca. 6 mm. longus. Stigma rhomboidea. Capsula ignota.

V. gracilis affinis, sed a qua foliis minoribus petiolatis, pedicellis brevioribus, calycis majoribus bifidis, corollis majoribus clavatis differt.

Hab. Tongking: Dran (B. Hayata, 14 Jun. 1921—Typus in Herb. Univ. Tokyo).

This plant resembles *Vandellia gracilis* Bonati in having half-united sepals. This character is intermediate between united sepals as *V. crustacea* and *V.*

oblonga, and separated sepals which are seen in the majority of this genus as *V. viscosa*, *V. pusilla*, and *V. angustifolia*, etc., so united sepals are not always a distinct character in separating genera.

Vandellia perennans Yamazaki, sp. nov.

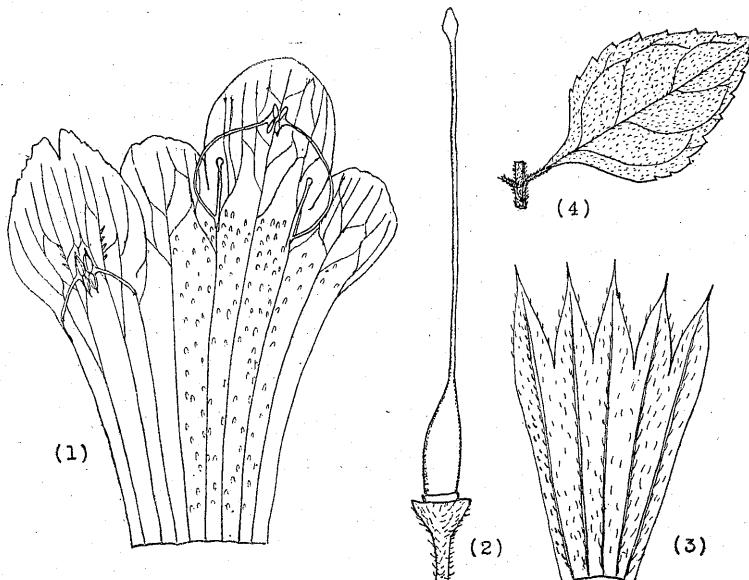


Fig. 4. *Vandellia perennans*. 1) Corolla expansa $\times 4$, 2) Pistillum $\times 6$,
3) Calyx expansa $\times 6$, 4) Folium mag. nat.

Herba perennis. Caulis longissime repens stoloniformis basi sublignosus multiradicans 20-50 cm. longus ad nodos radiculatus tetragonous hirsutus, ramis ad nodos solitariis gracilibus prostratis vel erectis. Folia inferiora caduca media et superiora opposita chartacea, petiolis 5-10 mm. longis hirsutis, laminis ovatis acutis basi cuneatis vel cuneato-rotundatis 12-33 mm. longis 7-22 mm. latis utrinque hirsutis margine utrinque 8-11-serratis, serris late ovatis mucronatis. Inflorescentia ad axillas foliorum vel ad terminales ramorum racemosa 2-3-florifera, pedunculis 13-18 mm. longis gracilibus dense hirsutis, pedicellis 3-8 mm. longis striatis gracilibus dense hirsutis. Bractae setaceae ca. 1.5 mm. longae. Calyx tubulosus sursum dilatatus 6-7 mm. longus 5-costatus dense hirsutus apice 5-lobatus, lobis lanceolato-linearibus acuminatis ca. 2 mm. longis margine hirsutis, costis obsolete alatis hirsutis. Corolla ("upper lip red, lower lip yellow")

described by Hayata) 11–15 mm. longa, tubo cylindrico 7–10 mm. longo intus ventrale punctato-lanato, labio superiore ovato apice ca. 5 mm. longo et lato, lobis ovatis obtusis margine repandis, labio inferiore dilatato ca. 6 mm. longo irregulariter trilobato, lobis lateralibus orbiculatis ca. 3 mm. longis et latis margine repandis, lobo medio elliptico ca. 4 mm. longo et lato. Stamina 2 antica perfecta, appendicibus gracilibus filiformibus. Ovarium oblique anguste oblongum glabrum. Stylus ca. 7 mm. longus calyce superans. Stigma anguste rhomboidea. Capsula immaturata oblonga obtusa calyce inclusa ca. 5 mm. longa 2 mm. lata.

Hab. Tongking: Tamdao (B. Hayata, 28 Jul. 1917—Typus in Herb. Univ. Tokyo).

This plant naturally falls in the genus *Vandellia* because of its small flowers with ovate upper lips and glabrous ovaries. It is closely allied to *V. crustacea* in having sepals united over 1/2 of its length, but differs by perennial ligneous stems. These characters match well those of *Geoffraya*, which was reported by Bonati from Indo-China and has been represented by 2 species, although the later genus has linear leaves. *Craterostigma*, which is distributed in South and Central Africa and includes about 20 species, also has the same characters. These related genera need further critical studies.

Trichotaenia Yamazaki, gen. nov.

Caulis prostratus diffusus basi paucе ramosus tetragonus ad angulos striatus. Folia carnosa opposita sessilia lanceolato-linearia in sectione triangula basi semi-amplexicaulia margine integra. Flores in axillis foliorum superiorum solitarii, pedicellis tetragonis. Calyx cylindrico-campanulatus 5-costatus ad costas obsolete striato-alatus, alis glabris, sepalis 2 inferioribus connatis apice bilobatis 3 superioribus usque ad medium connatis. Corolla calyce exserta bilabiata, tubo cylindrico superne parum ampliato extus glabro intus inferne piloso, labio superiore ovato margine repando, labio inferiore superiore subaequilongo trilobo, lobis orbiculatis. Stamina 4 fertilia, 2 postica tubo affixa inclusa, filamentis filiformibus glabris, 2 antica ad faucem affixa, filamentis elongatis arcuatis sub labio postico conniventibus, basi appendice carnosо-clavato auctis. Antherae per paria arcte cohaerentes, loculis divaricatis apice confluentibus. Ovarium oblique ovatum apice hirsutum. Stylus calyce superans apice bilamellatus, lamellibus intus stigmatosis. Capsula elliptica calyce inclusa.

A *Vandellia*, calycis ad alis tantum glabris ceteris pilosis, ovariis apice hirsutis, corollis intus inferne pilosis differt.

T. saginiformis (Bonati) Yamazaki comb. nov.—*Vandellia saginiformis* Bonati in Bull. Soc. Bot. Genève 1913: 240.—*Lindernia saginiformis* (Bonati) Bonati in Lecomte, Fl. Gén. Indo-China, 4: 412 (1927).

Herba humilis. Radix simplex crassiuscula. Caulis prostratus diffusus non radicans basi pauciramosus 2–8 cm. longus, ramis simplicibus tetragonis glabris ad angulos striatis. Folia subcarnosa opposita sessilia lanceolato-linearia inferiora leviter dilatata semiamplexicaulia superiora sursum angustata acuminata 8–13 mm. longa 1–1.5 mm. lata marginata integra margine inferiora sparse longipilosa superiora scabrida utrinque glabra. Flores in axillis foliorum superiorum solitarii 2–5-floriferi, pedicellis gracilibus sparse longipilosis in anthesi 8–15 mm. longis in fructu usque ad 20 mm. longis tetragonis. Calyx cylindrico-campanulatus 5-costatus ad costas obsolete alatus, alis glabris ceteris sparse longipilosus, in anthesi 4 mm. in fructu 5 mm. longus bifidus, laciniis superioribus ca. 3 mm. longis trifidis, lobis linear-lanceolatis acuminatis apice setaceis sub lente margine scabridis, laciniis inferioribus vix bilobatis, lobis acuminatis apice setaceis sub lente margine scabridis. Corolla ca. 7 mm. longa, tubo ca. 5 mm. longo extus glabro intus inferiore piloso, fauce ventrale punctato, labio superiore ca. 2.5 mm. longo et lato apice bifido, lobis lanceolatis acuminatis margine repandis, labio inferiore superiore subaequilongo ca. 2.5 mm. longo subaequaliter trilobato, lobis orbiculatis ca. 1.5 mm. longis et latis margine obsolete repandis. Stamina 4 fertilia didynama, 2 antica basi appendices carnosas clavatas obstita, loculis antherarum obtusis. Ovarium oblique ovatum apice scabridum. Stylus calyce

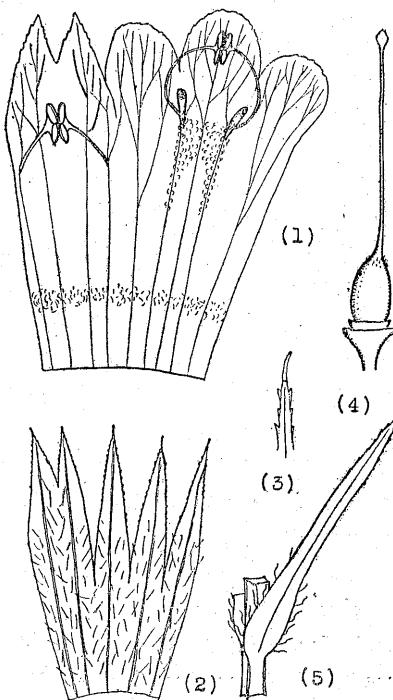


Fig. 5. *Trichotaenia saginiformis*. 1) Corolla expansa $\times 6$, 2) Calyx expansa $\times 6$, 3) Pars sepalis auct., 4) Pistillum $\times 6$, 5) Folium $\times 4$.

superans ca. 4 mm. longus. Stigma flabellata. Capsula elliptica apice acuta 3 mm. longa 1.5 mm. lata calyce inclusa.

A typo, caulis tetragonis, follis integris latioribus, calycibus majoribus longipilosis, sepalis lanceolatis setaceis, corollis non curvatis differt.

Hab. Tongking: Natrang (B. Hayata, no. 499, 12 Mai. 1921).

A plant which was collected from Natrang in Tongking, agrees well with *Vandellia saginiformis* Bonati except for a few unimportant characters. This plant has ciliated ovaries like *Torenia*, in which it is one of the important characters of the genus, while its flowers strikingly resemble those of *Vandellia* with small corollas and ovate upper lips, so it can neither be united with *Vandellia* nor *Torenia*. Moreover, in *Vandellia* and *Torenia*, when the calyx is hairy, hairs grow along the edge of midveins of lobes, while in this plant, hairs grow in the intermediate portions between two midveins, and the calyx has glabrous midveins. Densely distributed unicellular hairs which present on the inner lower side of the corolla, are not found in *Vandellia* and *Torenia*. By such remarkable differences it becomes possible to distinguish this species from other members as representing a new genus. At present this new genus consists of two species and is known only from Indo-China.

T. fasciculata (Bonati) Yamazaki, comb. nov.—*Lindernia fasciculata* Bonati in Bull. Soc. Bot. Genève, 1928: 112; in Lecomte, l. c. 12.

東京大學の腊葉室には、故早田文藏先生が大正6年6月から8月にかけてトンキン・雲南へ、大正10年5月から6月にかけてアンナンへ、同年9月から12月にかけてシャムの北西部へ旅行された時採集された標本が數萬點あり、殆んど未整理のままである。この中にはゴマノハグサ科植物も多數あり、未知なものがかなり含まれている。ここにはウリクサ類についての見解を報告した。

ウリクサ類は日本にも數種類分布しているが、本據はインドシナ、インド、アフリカなどの熱帶地方であり、色々な属と多數の種類が知られているが、形態的に非常に變化に富み、これらの属の限界にも不明な點が多い。早田先生の採集品の中にも、これらの属のあいだの類縁を示す、いくつかの種類がみいだされる。この地域の調査が進めばウリクサ類の分類はいつそうはつきりするだろう。

Artanema Finetiana. Bonati 氏はこれをハナウリクサ属 (*Torenia*) に屬さしめたが、萼片は線形で基部まで分裂し、子房は無毛である點異つて。このような特徴はアゼナ属 (*Lindernia*)、ウリクサ属 (*Vandellia*) などにみられる性質である。ところがこれらの属の植物は全體が小さく、花の大きさは普通 7~8 mm 大きくてせいぜい 15 mm

どまりであるし、花冠上唇は卵形か舌状である。然しこの植物は全體が大きく花は2~4 cm、上唇は圓形であるなどハナウリクサ屬に似る。最も近いのはニューギニア、オーストラリアからインド、アフリカにかけて熱帶地方に廣く分布し、3種類ほど知られている *Artanema* である。然しいくつかの點で *Artanema* とも一致しないし、*Artanema* の實物を見る機會がないので、多くの疑問が残されている。

Vandellia nutans. いつけんコナスビを思わせるような1年生の草である。花期には花が上にむいているが、花後下垂する特徴が目立つ。假軸分枝をする點、今まで知られたウリクサ屬がみな單軸分枝であつたのと著しく異なる。おしひの附屬突起は大きな球形で、多數の腺點で被われている、このようなよく發達した附屬突起を持つものは今までのウリクサ屬にはみられず、*Craterostigma* の特徴の一つとされているものである。

Vandellia ligulata. 蓼は5裂片からなるが、上部3裂片と下部2裂片が、それぞれ不規則に半ば以上融合する傾向があり、5裂片がすべて融合しているウリクサと5裂片が基部まで離れている他のウリクサ屬の種類との中間的な性質をもつ。ウリクサは蓼が融合している點でハナウリクサ屬としてあつかわれたこと也有つたが、屬を區別するほど蓼の性質が特異なものでないことが、この中間的な種類から示される。又この植物は花冠の上唇辨が舌状であり、卵形の上唇をもつウリクサ屬の多くの種類とは異り、スズメノトウガラシ類の性質に似る。然しおしひの形態はウリクサ類に一致する。

Vandellia perennans. 瘦化した蓼をもつ點ウリクサに似るが、多年生で木化した莖をもつ點異つていて。インドシナから2種類報告されている *Geoffraya* は葉は線形であるが、花の形や多年生である點似ている。又中央アフリカ・南アフリカから20種ほど知られている *Craterostigma* も似たような性質をもち、これらが1連の群であることを想像させる。

Trichotaenia saginiformis. Bonati 氏はこれをウリクサ屬に入れたが、子房に毛状突起がある點で異なる。花冠の基部内面に帶状に軟毛を有する點もウリクサ屬にみられない性質であるので、新屬をたてた。

○カボンバの水上葉 (久内清孝) Kiyotaka HISAUCHI: On the floating leaf of *Cabomba caroliniana* A. Gray.

カボンバ すなわちハゴロモの水上葉は橢圓形楯形であることは周知の事實であるが、昨年中野治房博士は千葉縣の安食で葉の下半部が裂けて居るため矢状になつているものを得られた。そして同地のものは全部それであつたことである。あわてると、新名がほしくなるが、米國の本を色々見ると、あちらには、往々あるらしい。恐らくそんなレースが安食に從來のものと別の経路ではいつて來たものと思われるが面白いことである。